

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Professor von Siebold and the Freshwater Fishes of England

THE object of the present letter is to appeal to naturalists throughout the British Islands to assist Prof. von Siebold—the eminent zoologist of Munich—in his studies of the freshwater fishes of Europe. Prof. Siebold is preparing a new edition of his well-known work on that subject, and is exceedingly anxious to obtain specimens of some of our British freshwater fishes to compare with the specimens which he has collected from all parts of Europe. In spite of various attempts, he has, I am very sorry to have to say, failed to obtain specimens from English naturalists. I am sure that this can be only owing to the fact that he has not been able to make his wants known directly to those who could help him. I have not myself been able to do much in supplying the specimens of which he forwarded to me a list, but from the Thames at Oxford have sent him Dace, Bleak, Pope, Miller's Thumb, and Sticklebacks. The list to which I refer included the Graining and the Azurine fishes which have been obtained in or near Knowsley Park; and I have received a kind assurance from Lord Derby that efforts shall be made to procure specimens for Prof. Siebold. Specimens of these and of the Powan, the Pollan, the Gwyniad, and the Vendace, are the chief desiderata which I am anxious to obtain for Prof. Siebold; his list also includes the Sharp-nosed and the Broad-nosed Eel.

If any naturalist who possesses specimens of these fish which he can spare for the purposes of scientific investigation, or who can by reason of local opportunity obtain such specimens, will forward them to me at University College, London, preserved in spirit, I will transmit them to Prof. Siebold, taking care that he shall know to whom he is indebted in each case.

A more difficult task, I am afraid, is that of procuring specimens of the Brine Shrimp, *Artemia salina*. Prof. Siebold has made an extensive study of specimens of *Artemia* and allied Branchiopoda from various European localities, and is anxious to compare English specimens with those from other localities. He wishes especially to obtain "gatherings" of these Crustacea in order to determine the absence, presence, and relative abundance of the male sex in different localities. Specimens from Lymington or from Guernsey would be very welcome.

I hope that through the columns of NATURE I may succeed in reaching those naturalists who, I am sure, are not few in number, who will be willing to contribute material for the valuable researches which Prof. Siebold has so long been carrying on.

E. RAY LANKESTER

March 5

Seasonal Flower Distribution and the Radiometer Vagaries

ALTHOUGH apparently so dissimilar, there is an intimate connection between the seasonal order of colour in flowers and the seeming erratic behaviour of certain radiometers.

Whatever be the cause of the mechanical action of light which is now exciting so much attention, the kind of light remaining the same, the experiments show that different surfaces produce dissimilar effects, the results with pith discs applying to pith only and being different from those obtained with mica, which strictly apply to mica alone. This is due in all probability to the difference in inter-molecular conditions presented by the two substances. When these conditions are thoroughly understood and a proper margin allowed for experimental errors, the observations which seem now at variance will most likely be reconciled. To acquire the needed knowledge, it is my humble opinion that some modification of the present method will be required, because many of the comparative experiments which have been tried hitherto in the domain of radiant light and heat are open to the objection that heterogeneous bodies having been dealt with, a difference of chemical constitution has been introduced for which no allowance could be made. To obviate this in the present instance, and ascertain the result of such differences, would it not be well to employ the following typical mode of procedure:

In preparing the radiometer, let the discs be dipped into melted

sulphur, or other convenient colour-changing body, and the completed apparatus inclosed in a jacket for the convenience of raising the temperature. A series of observations made at the normal temperature, when compared with a like series made at a high temperature, would doubtless reveal many interesting facts. There are many difficulties in the way which would take much experiment to overcome.

Now turn we to the flowers. The former question seems to depend probably upon the reflection of light, and the latter on absorption, the one being complementary to the other. I would here call the attention of your readers to the behaviour of inorganic coloured bodies when heated and to the laws of colour-change given in NATURE (vol. xiii. p. 298). There is here such an identity of relations as nearly to preclude the possibility of its being a mere coincidence. I shall speak more particularly of this in another note in a few days.

In reply to Mr. Rogers' query (p. 326), it may be remarked that *absorbed light* seems to be the active agent in vital work, e.g., it is the light absorbed by the retina which, as motion of some kind, is transmitted along the optic nerve. This being the case, it would seem highly probable that to exclude from a flower such light as it reflects would not affect it at all, although of course the only sure answer to such a query is experiment.

Feb. 28

WM. ACKROYD

D-line Spectra

WITH reference to Prof. Stokes's courteous but rather theoretical explanation in NATURE, vol. xii. page 247 (which I have been prevented from acknowledging before), I would ask him or yourself for a practical explanation of the following simple experiment:—

1. If platinum wire be reddened from a constant source of heat, as that applied to it by means of a blowpipe and a candle, we find the D-line spectra indefinitely produced until incandescence takes place by *additional* heat, or, in other words, that their permanency is in direct proportion to the *bulk* of the wire used, and in inverse proportion to the amount of heat applied. We can therefore, by using a *thick* platinum wire and the ordinary flame of a blowpipe, produce D-line spectra as long as we like, or as long as the fuel lasts.

2. Now if this D-line producing flame be due to sodium, its action for a long period upon a reagent so sensitive to sodium as is *Boric Acid*, ought to give a reaction by which the presence of that alkali would be detected. Thus, if a pin's head speck of pure cobalt oxide be heated by a blowpipe in a bead of pure boric acid, it forms within it a *black ball* which the minutest trace of any *sodium* salt partially dissipates, causing a *pink* suffusion round the ball.

3. A boric acid bead fused upon the ring of a thin or ordinary platinum wire, which has previously been made incandescent by a blowpipe flame, i.e., from which the D-line producing property has been previously removed, is clear, colourless, and refractive as a diamond; but if the same boric acid be fused upon a *thick* platinum wire with the same degree of heat, the bead is *opaque* and *almost opaque*; and this phenomenon seems evidently and only referable to the above-mentioned permanency of the D-line spectra produced in the latter case.

4. To settle this point, however, let us fuse a clear colourless bead of boric acid on an ordinary platinum wire, and screw that in a geometrical pen, along with, but a little *behind* (that is, *away* from the source of heat) a *thick* platinum wire, so that the D-line producing flame from the thick, hot wire, impinges constantly and for some time upon the clear boric acid bead; we find opacity produced as in the former case. Now, supposing sodium to be in this case, the producer of the D-line spectra, we ought to have, in the opalised boric acid, a tangible result of the effect of applying to it (according to Prof. Stokes) "free sodium," but, on heating in it, as before, a speck of cobalt oxide, there is *no* dissipation of any part of the resulting ball, nor the least pink suffusion, but, on the contrary, a reaction, decided indeed, but *almost exactly* the opposite of that caused by adding sodium to the bead in any proportion.

5. Let us now screw a platinum wire ring containing a boric acid bead with a cobalt-borate ball inside, into a geometrical pen behind another platinum ring containing a bead of some soda salt, and heat both together with a blowpipe, so that the orange flame from the latter impinges upon the former. Instead of opalescence, similar to that caused by the orange flame from the thick platinum (4), we find the viscous boric acid made *more*

fluid and clear, the cobalt borate ball partly dissipated, and, on cooling, the surface of the bead presenting a pink appearance, evidently caused by projected particles of soda, volatilised *per se*.

It would thus seem that the blowpipe is even a more delicate analytical weapon than the spectroscope, for it distinguishes between two flames exhibiting D-line spectra only, which spectrum analysis does not.

W. A. Ross

March 6

The Screw-Propeller in Nature

Now that the question of the best form of the screw as a propeller has become of such importance it is interesting to note what Nature has done in this direction.

The seed of the ash (*Fraxinus excelsior*) is provided with a wing very delicately twisted, and, when the seed falls, the action of the air upon this screw-like wing causes it to revolve rapidly. The result is that the seed is kept suspended in the air for a comparatively long time, and is wasted by the slightest breeze to a considerable distance from the parent tree. I do not know that this peculiarity is referred to in any botanical work, but it very beautifully fulfils the object which characterises more completely the lighter-winged seeds, viz., the dispersion of the seed beyond the limits of the plant or tree which bears it.

I am not by any means sure that the screw on the ash seed will not by its own action, independently of any wind, work itself away, in its fall, from the perpendicular line. But, when the wind blows strongly—and it takes a strong wind to blow the seeds off at all—their range is very extensive.

The seeds hang stubbornly to the tree through the winter months, reserving themselves for the March gales, of which the wind-fertilising plants avail themselves so largely.

I should much like to know if any of your readers have observed this screw and studied its pitch, and it would be very remarkable should it prove that the pitch of this natural screw is the one which will give the most power to the propeller of a steamer.

The seeds of the maple and the sycamore have somewhat similar appendages, but the screw is, in neither case, so marked. If anyone, at this season, will throw up a stick at the seed clusters of ash, maple, or sycamore, he will find the seeds come fluttering to the ground like a cloud of butterflies and alighting quite as softly on the ground.

Feb. 15

ALFRED GEORGE RENSHAW

The Migration of Species

IN NATURE, vol. xii. p. 86, I read a communication signed "W. L. Distant," in which the writer states that sea-going ships were frequently visited by both birds and insects.

In confirmation of this fact, I can mention from my own observation two instances of birds visiting ships in which I was making the homeward voyage from the West Indies, and one instance on a voyage to New Zealand, in which the visitor was a butterfly.

In the first case, the ship being off the Spanish coast, but not in sight of land, a very handsome bird came on board. It was a species of dove, blue being the principal colour, with darker markings. Some of the seamen called it a Spanish dove. It was caged and taken home by one of the passengers.

In the second case, being in the neighbourhood of Bermuda, a large flight of a species of swallow settled on the vessel. These poor birds were in a very exhausted condition, and numbers of them were captured by a large cat belonging to the ship. The survivors continued their passage at daybreak next morning.

In the year 186—, on a voyage to New Zealand, we were one morning visited by a butterfly, there being at the time a light breeze blowing. My sons made great efforts to capture this interesting stranger, but unfortunately without success, as it fluttered overboard, and was soon lost to sight in the hollows of the waves. They, however, got sufficiently near to ascertain it to be a true butterfly. The colour consisted of various shades of rich orange brown, and the margins of the wings were deeply indented.

I made careful inquiries of the officers of the ship as to the proximity of land, and was informed that the nearest was the rock of St. Paul's, then fully two hundred miles distant.

M. DASENT

Patea, Taranaki, New Zealand, Nov. 18, 1875

The Three Kingdoms of Nature

SOME children were playing at a game called "The Kingdoms," which consists in the mention of various substances, and asking if they belong to the animal, vegetable, or mineral kingdoms. One little girl mentioned "water," and the company were puzzled as to which kingdom it should be assigned. Is there a sub-aërial or gaseous kingdom? Will you kindly enlighten the members of our

NURSERY?

March 4

OUR ASTRONOMICAL COLUMN

THE VARIABLE STAR, β PERSEI (ALGOL). — Herr Julius Schmidt, Director of the Observatory at Athens, publishes in the *Astronomische Nachrichten* the results of observations on the times of minima of this variable star, extending from August 1846 to November 1875. The epochs are given in Paris mean time with correction for the light-equation. The probable error of a single determination of the time of minimum from 183 observations by Schmidt is ± 80 minutes; fifty observations of Argelander gave a probable error of ± 60 minutes, and fifty-five observations of Schönfeld, one of ± 46 minutes, showing by a mean of the 288 observations a probable error of ± 70 minutes. The period assumed by Schmidt in the discussion of his Algol observations between 1840-1875 is 2d. 20h. 48m. 53 $^{\circ}$ s.

Some interesting details respecting this star are found in Schönfeld's "Der Lichtwandel des Sterns Algol im Perseus" (Mannheim, 1870). His comparison stars and their relative assumed brightnesses were:—

Star.		Brightness.
ν Persei	...	... 0'9 in grades.
α Trianguli	...	... 3'5 "
δ Persei	...	... 7'8 "
β Trianguli	...	... 9'1 "
γ Persei	...	... 10'9 "
ϵ Persei	...	... 12'8 "
β Arietis	...	... 16'7 "
ι Aurigae	...	... 17'3 "
γ Andromedæ	...	... 23'4 "

The following, extracted from the more extensive table given by Schönfeld in his treatise, will indicate the law of variation as derived from the light curve:—

Distance from Minimum. h. m.	Brightness.	
	Before.	After.
4 30	20'7	...
4 0	20'2	...
3 30	19'6	...
3 0	18'7	...
2 30	17'4	...
2 0	15'3	...
1 30	12'1	...
1 0	8'5	...
0 30	6'3	...
0 0	5'6	...

The most probable period over which the variation extends is 9 $\frac{1}{4}$ hours, and the minimum lies very nearly in the middle of the same. The most perceptible diminution of brightness occurs 1h. 26m. before the minimum, when the star is somewhat fainter than the mean of γ and ϵ Persei, and the most perceptible augmentation when the star arrives at nearly the same degree of brightness, but 1h. 47m. after minimum. In this phase it is hardly fainter than the mean of δ Persei and α Trianguli. Schönfeld states that to his eye the variation of Algol is included between the magnitudes 2'2 and 3'7; he considers γ Andromedæ an average star of the second magnitude, δ Persei 3'5, α Trianguli about 3'1, and ν Persei 4'1.

For elements of Algol we may adopt at present the following, derived from Schönfeld's last catalogue. First minimum of 1876 .. January 223233 Greenwich mean time; period 2867288.